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SOLAR OBSERVATIONS.

SOLAR AND SKY RADIATION MEASUREMENTS DURING AUGUST, 1921.

By HERBERT H. KIMBALL, Meteorologist.

For a description of instruments and exposures and an account of the method of obtaining and reducing the measurements the reader is referred to this REVIEW for April, 1920, 48:225.

From Table 1 it is seen that direct solar radiation intensities were close to normal August values at all the stations, and Table 2 shows that the total solar and sky radiation received on a horizontal surface was above the August normal, the excess averaging about 7 per cent at Washington and 4 per cent at Madison.

Skylight polarization measurements made on five days at Washington give a mean of 54 per cent and a maximum of 61 per cent on the 22d. At Madison, measurements obtained on 13 days give a mean of 57 per cent and a maximum of 70 per cent on the 8th. These are average values for August at Washington, but slightly below average at Madison.

TABLE 1.—*Solar radiation intensities during August, 1921.*

[Gram-calories per minute per square centimeter of normal surface.]

Washington, D. C.

Date.	Sun's zenith distance. 8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon.
	75th meridian time.	Air mass. A. M.					P. M.				Local mean solar time.
	e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Aug. 3	17.96	.....	0.58	0.75	0.99	1.32	.....	.....	.....	.....	18.59
9	11.81	.....	.....	.....	.....	1.21	.....	.....	.....	.....	9.47
10	14.60	.....	.....	.....	.....	1.15	.....	.....	.....	.....	12.68
15	8.48	.....	.....	.....	.....	.....	.....	0.98	.....	.....	7.87
18	16.79	.....	.....	.....	1.05	1.21	.....	.....	.....	.....	14.10
19	13.61	.....	.....	.....	1.04	1.18	.....	.....	.....	.....	12.24
22	8.81	.....	.....	0.91	1.09	.....	.....	.....	.....	.....	8.48
26	11.81	0.47	0.60	0.75	.....	1.18	.....	.....	.....	.....	9.14
27	10.97	0.61	0.72	0.85	1.00	1.30	.....	.....	.....	.....	8.48
30	17.96	.....	.....	.....	.....	1.25	0.90	0.68	0.57	0.48	15.11
31	16.79	.....	.....	.....	0.85	1.03	.....	.....	.....	.....	16.20
Means	.....	(0.54)	0.63	0.82	1.00	1.20	(1.02)	(0.83)	(0.57)	(0.48)	.....
Departures	.....	−0.03	+0.04	+0.07	+0.09	−0.03	+0.05	+0.03	−0.02	−0.04	.....

Madison, Wis.

Aug. 4	12.24	.....	.....	.....	1.04	1.34	.....	.....	.....	.....	12.24
6	10.97	.....	.....	0.92	1.11	1.44	.....	.....	.....	.....	7.87
7	8.81	.....	.....	.....	1.22	.....	.....	.....	.....	.....	8.18
8	7.87	.....	.....	.....	1.19	.....	.....	.....	.....	.....	7.87
11	17.96	.....	.....	.....	0.94	.....	.....	.....	.....	.....	16.20
18	14.10	.....	.....	.....	.....	1.35	1.14	0.93	.....	.....	11.38
19	13.13	.....	.....	0.84	1.03	1.29	.....	.....	.....	.....	18.59
20	10.59	.....	.....	1.06	1.22	1.40	.....	.....	.....	.....	9.83
21	10.59	.....	.....	1.05	1.21	.....	.....	.....	.....	.....	8.18
23	10.21	.....	.....	.....	0.81	1.04	.....	.....	.....	.....	14.10
24	16.20	.....	.....	.....	.....	1.16	0.79	0.54	.....	.....	16.79
25	15.65	.....	.....	.....	.....	1.09	0.81	.....	.....	.....	14.10
27	16.79	.....	.....	.....	.....	1.37	.....	.....	.....	.....	15.65
28	15.65	.....	.....	.....	0.83	1.29	.....	.....	.....	.....	17.37
29	16.20	.....	.....	.....	.....	1.11	.....	.....	.....	.....	19.89
30	19.23	.....	.....	0.62	0.79	1.01	.....	.....	.....	.....	21.28
Means	.....	.....	.....	0.90	1.04	1.24	0.91	0.74	.....	.....	.....
Departures	.....	.....	.....	−0.02	−0.04	−0.06	−0.12	−0.11	.....	.....	.....

* Extrapolated.

TABLE 1.—*Solar radiation intensities during August, 1921*—Continued.

Lincoln, Nebr.

Date.	Sun's zenith distance. 8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon
	75th meridian time.	Air mass. A. M.					P. M.				Local mean solar time.
	e.	5.0	4.0	3.0	2.0	1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Aug. 3	11.38	.....	.....	0.75	1.15	.....	.....	.....	.....	.....	13.39
8	10.97	.....	.....	1.03	1.19	.....	.....	0.90	0.78	0.65	16.20
9	13.61	.....	0.73	0.84	0.98	1.29	.....	.....	.....	.....	21.28
11	15.11	.....	.....	.....	.....	.....	.....	0.79	0.68	.....	15.11
12	13.61	.....	.....	.....	1.03	.....	1.00	0.82	0.70	0.60	18.59
17	12.24	.....	0.77	0.98	1.17	1.36	1.11	0.92	0.80	0.64	13.61
18	12.68	.....	0.79	0.93	1.13	1.28	1.05	0.88	0.69	0.63	17.96
22	17.37	.....	.....	.....	.....	1.35	1.05	0.82	0.65	0.57	14.60
24	19.89	.....	.....	.....	.....	1.30	0.99	0.91	0.69	0.56	17.37
25	5.26	.....	0.70	0.84	1.04	1.27	0.90	0.73	.....	.....	19.89
27	17.96	.....	.....	.....	.....	1.39	1.07	0.89	0.76	0.65	20.57
31	16.20	.....	.....	0.89	1.09	1.41	.....	.....	.....	.....	18.59
Means	.....	.....	0.75	0.89	1.10	1.33	1.02	0.85	0.72	0.61	.....
Departures	.....	.....	−0.04	±0.00	+0.03	−0.01	−0.07	−0.05	−0.04	−0.08	.....

Santa Fe, N. Mex.

Aug. 10	9.14	.....	.....	.....	.....	1.48	.....	.....	.....	.....	9.14
17	6.76	.....	1.11	1.23	1.36	1.51	.....	.....	.....	.....	6.27
20	9.14	0.94	1.04	.....	.....	.....	.....	.....	.....	.....	9.83
22	8.18	.....	1.08	.....	.....	.....	.....	.....	.....	.....	8.18
25	9.47	.....	1.00	1.11	1.26	.....	.....	.....	.....	.....	8.48
26	7.57	.....	1.02	1.15	1.30	1.47	.....	.....	.....	.....	7.29
27	7.29	0.86	0.98	1.12	1.27	1.46	.....	.....	.....	.....	7.87
Means	.....	(0.90)	1.04	1.15	1.30	1.48	.....	.....	.....	.....	.....
Departures	.....	−0.02	+0.05	+0.05	+0.05	+0.03	.....	.....	.....	.....	.....

TABLE 2.—*Solar and sky radiation received on a horizontal surface.*

Week beginning.	Average daily radiation. Washington.	Madison.	Lincoln.	Average daily departure for the week. Washington.	Madison.	Lincoln.	Excess or deficiency since first of year. Washington.	Madison.	Lincoln.
	cal.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
July 30	486	460	.....	+ 12	−16	.....	+ 635	−4,341	.....
Aug. 6	491	466	.....	+ 31	+ 6	.....	+ 852	−4,298	.....
Aug. 13	440	492	.....	− 1	+47	.....	+ 848	−3,966	.....
Aug. 20	543	439	.....	+123	+14	.....	+1,706	−3,870	.....
Aug. 27	467	406	.....	+ 60	+ 2	.....	+2,128	−3,855	.....

MEASUREMENTS OF THE SOLAR CONSTANT OF RADIATION AT CALAMA, CHILE, JUNE AND JULY, 1921.

By C. G. ABBOT, Assistant Secretary.

[Smithsonian Institution, Washington, Sept. 29, 1921.]

In continuation of preceding publications, I give in the following table the results obtained at Montezuma, near Calama, Chile, in June and July, 1921, for the solar constant of radiation. The reader is referred to this REVIEW for February, August and September, 1919, for statements of the arrangement and meaning of the table.

It will be noted that in contrast to the June and early July values the observations reported from July 9 to